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(AGRI.-OGDEN)

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STATEMENT OF PURPOSE

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This publication is printed primarily to inform professional range administrators of important range improvement and management developments and findings. These "Notes" may include extracts of published papers, unpublished preliminary reports of research work, unpublished reports on administrative studies and personal observations or suggestions of other range administrators. No claim is made as to the accuracy or completeness of studies or conclusions drawn.

All who read these RANGE IMPROVEMENT NOTES are encouraged to submit material for publication, or suggestions for improving its usefulness. Full credit will be given for any material used.

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NEW PHILOSOPHY*
(1925)

The following is reprinted from "The ABC's of Range Management" by C. L. Forsling, Great Basin Experiment Station.

Admit stock when the range is in vegetational readiness and not before.
Beware of overstocking and too early use. They are the root of much evil.
Calculate the carrying capacity of each unit of range and stock accordingly.
Distribute cattle properly at the time they are turned on the range.
Establish salting plans with the view of proper distribution of cattle and even utilization of the forage.
For every 500 to 1,000 head of cattle, have one rider to look after them.
Give every herder instructions as to how he is to use his allotment.
Have sheep herded openly and quietly and bedded where night overtakes them.
Install the deferred and rotation system of grazing to improve and maintain the forage cover.
Join range users together in associations to handle their stock.
Know the important plants of the range, their forage value, growth requirements and symptoms of overgrazing.
Let protected areas and sample plots help you in judging conditions and use of the range.
Make regular inspections to note conditions of range and livestock, and observance of rules by users.
Nab the trespasser as quickly as possible.
Observe any grazing injury to tree reproduction that may be occurring and take steps to prevent the damage.
Prevent forest fires; it pays.
Quietly promote the cooperation and interest of users in the welfare of the range.
Reserve sufficient forage for game and allow for recreational use.
Succeed in obtaining a reliable record of the range resources and how they are being used, and decide how they may be utilized, improved, and developed to better advantage.

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* As reported in the Region 1 RANGE AND WILDLIFE ABSTRACTS, November 13, 1963.

Thoroughly familiarize yourself with poisonous plants and methods of range management to avoid losses from them.

Unite your policy, objectives, and plan of grazing and developing the range into a range management plan for your future guidance and the guidance of your successor.

Verse yourself in the results of grazing investigations and the latest developments in range management.

Watch the working of your grazing plan to determine where it might be improved.

Xtend the gospel of good range management whenever opportunity affords.

Yield not to the temptation of a little feed left well distributed over the range at the close of the grazing season. It is insurance against over-grazing, damage to watersheds, and dry years.

Zealously practice these A B C's of range management.

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The greater capacity of continuous thinking
that a man possesses the longer and more
steadily can he follow out the same train of
thought--the stronger is his power of attention;
and in proportion to his power of attention will
be the success with which his labor is rewarded.

Sir William Hamilton

Always dream and shoot HIGHER than you
know you can do.
DON'T bother just to be better
than your contemporaries or predecessors
TRY to be better than YOURSELF.

William Faulkner

COST OF SPRAYING SAGEBRUSH WITH GROUND RIGS

By Rollo H. Brunson*

Ground spray rigs were successfully used to spray 1,270 acres of big sagebrush on the Gentry Mountain Cattle Allotment, Manti-LaSal National Forest. The work was done during the latter part of June when the sagebrush was at an optimum stage of growth. Soil moisture was sufficient to assure continuing growth after the spray was applied.

The topography on most of the sprayed areas is described as rolling plateau. Slip-on pumper units with boom-jet nozzles were used to accomplish the job. (Figures 1 and 2)

The sagebrush patches to be sprayed were interspersed with aspen groves that would have been damaged with aerial application. Similar projects have been aerially accomplished in the past, resulting in damage to associated sensitive species. Aerial spray application was, therefore, ruled out for this project.

The herbicide used was the iso-octyl (low volatile) ester of 2,4-D. It was applied at the estimated rate of two pounds acid equivalent per acre in a water carrier. The actual gallonage of spray solution applied per acre varied because of the different speeds at which the equipment traveled over irregular shaped areas and up and down slopes.

The cost summary for this project may be of interest to others who may be programming similar work (Table One).

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* District Forest Ranger, Castle Dale, Utah - Manti-LaSal National Forest

Figure 1 - Truck mounted slip on unit with auxiliary supply tank. Spray is distributed through boom-jet nozzles.

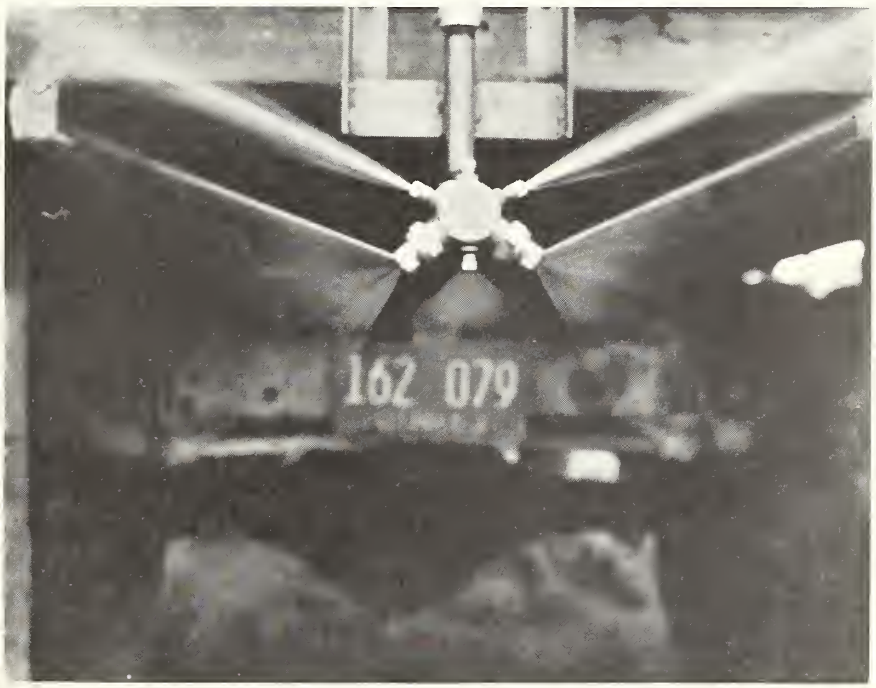

Figure 2 - Boom-jet nozzles can be operated over rough terrain where there would be excessive breakage of the spray boom arms of conventional rigs.

Table One

GENTRY MOUNTAIN SPRAY PROJECT
COST SUMMARY

		Total
A. Labor		
1. Supervision		$ 639.33
2. Labor		965.66
	Sub Total	$1,604.99
B. Per Diem		202.75
C. Mileage and Equipment Hire		
1. Forest Service Vehicles		$ 277.00
2. Rented Vehicles		391.00
3. Tractor/Dozer Hire		252.00
	Sub Total	$ 920.00
D. Materials		
1. Herbicide		$ 1,951.00
2. Fuel - Oil and Pump		94.56
3. Flexible Pipe, Fittings and Valves		72.80
4. Tank Rental, Repair, Binders and Racks		86.00
5. Truck Repairs		35.00
6. Pumper Equipment Amortization* (2472.50 / 5 years = 494.50/yr.)		494.00
	Sub Total	$ 2,733.36
E. Summary		
$5461.10 / 1270 Acres = $4.30/Acre	TOTAL	$ 5,461.10

* Three 200 gallon pumpers were contract purchased at a cost of $2872.50 ($957.50). The specifications included accessory items for use in fire fighting.

WATER HARVESTING

The following article is reprinted from AGRICULTURAL RESEARCH, September 1963, Vol. 12, No. 3.

"Within the next few years, water-harvesting treatments will be developed that will supply water for livestock at a cost of only 36 cents per thousand gallons at locations with 10 inches of annual precipitation," predicts L. E. Myers, Director of the U. S. Water Conservation Laboratory, Tempe, Arizona. In a 20-inch precipitation zone, the cost should be no more than 18 cents per 1,000 gallons.

Water harvesting is the collection of water from an area where soil has been treated to increase rainfall runoff. In arid locations, it conserves moisture that otherwise evaporates from bare soil or is transpired by nonbeneficial vegetation. Runoff collected for livestock and/or wildlive use is held behind dams, in tanks, or in butyl-coated nylon bags. Water could also be stored in natural underground sites.

These low-cost installations could be built in arid and semi-arid locations, where grazing land often is not fully utilized because there is no dependable water supply.

ARS soil scientist C. W. Lauritzen found in earlier research that artificial rubber sheeting and asphalt-coated jute fabric are highly effective for collecting precipitation (AGR. RES., March 1961, p. 6). He also developed a butyl-coated nylon bag to eliminate evaporation and seepage of the collected water. Agricultural engineers at the Tempe Laboratory reasoned that materials sprayed on the soil to make it impervious to water should be even less expensive than rubber or coated jute.

Initial research with standard anionic asphalt emulsions showed that they did not readily penetrate and bond to clay soils, although the installation cost was low. Most soil surfaces carry negative electrical charges, and the anionic emulsions--also negatively charged--were repelled.

The researchers then turned to cationic asphalt emulsions, which carry positive electrical charges and develop a tight chemical bond with the soil surface. But the speed of the bonding action was a liability; the emulsion bonded before penetrating deep enough into the soil to form a lasting cover. The engineers overcame this difficulty by temporarily halting the bonding process until the asphalt penetrated a desired half inch or more into the soil.

Even more promising are treatments in which cationic asphalt emulsions were combined with ground covers of aluminum foil, synthetic rubber, or plastic film. The cationic emulsions bond as well to these materials as to soil.

The engineers anchored a 2,500-square foot sheet of butyl rubber to the soil with cationic emulsions to prevent billowing of the rubber sheet by wind. The installation was made in warm weather, and the treated area was still capturing almost 100 percent of the runoff two years later. Polyethylene has been similarly bonded to soil in small plots.

In another experiment, asphalt emulsion was sprayed on the soil surface, and 1-mil aluminum foil was unrolled from a spindle in strips four feet wide. A foam-rubber roller, mounted behind the spindle, pressed the metal sheet against the emulsion-coated soil. Fiberglass reinforcing was added in some treatments. When properly installed, the foil-asphalt cover is durable and collects essentially 100 percent of runoff from rainfall.

The initial cost of these experimental treatments--including site preparation, materials, and installation on small plots--ranges from a high of about 45 cents per square yard for the foil-asphalt with fiberglass down to a low of about 10 cents per square yard for polyethylene and asphalt emulsions. Annual repairs and periodic replacement will cost 3 to 5 cents per square yard. These estimates include considerable hand labor.

Myers says that the annual cost should be less than 2 cents per square yard on larger areas, where application could be more completely mechanized.

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Whatever America hopes to
bring to pass in this world
must first come to pass in
the heart of America.

D. D. Eisenhower

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JOURNAL OF ECONOMIC ENTOMOLOGY
Vol. 56, No. 4, August 1963
pp. 459-462

Insects Destructive to Bitterbrush Flowers and Seeds in Southwestern Idaho[1]

Robert B. Ferguson, Malcolm M. Furniss,
and Joseph V. Basile[2]

Abstract

Studies were conducted to identify and evaluate the insects associated with flowers and seeds of bitterbrush. A 1.5% lindane emulsion spray was applied to reduce insect infestation on bitterbrush shrubs but proved to be phytotoxic. A 2% DDT emulsion spray was substituted but also caused some injury.

Six hundred flowers were selected for weekly observation on 10 sprayed shrubs and the same number on 10 unsprayed shrubs. Normal-appearing seeds resulted from 21 to 25% of the flower buds on sprayed and unsprayed shrubs, respectively. Production of fewer normal seeds on sprayed shrubs indicates that the phytotoxic effect of DDT added to or exceeded the effects of insects.

Causes of damage to flowers and seeds were determined by weekly examinations and dissections until June 26, when seed drop began. During the bud and flower stages, a thrips, Frankliniella occidentalis (Pergande), caused most identifiable damage. After seeds had formed and were still attached to the shrubs, a gall midge, possibly Phytophaga sp., led other insects in amount of seed destroyed, followed by the gelechiid, Filatima sp. near sperryi Clarke. Additional, less conspicuous damage possibly may result from punctures made by sucking insects, among which the pentatomid bug, Chlorochroa sayi Stal, was identified as a common seed feeder.

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1 The material reported herein was part of a cooperative study by the Intermountain Forest and Range Experiment Station of the U. S. Forest Service and the Idaho Fish and Game Department through federal aid to Wildlife Restoration Project W-111-R. Accepted for publication October 16, 1962.

2 Authors are range conservationist, entomologist, and range conservationist, respectively., Intermountain Forest and Range Experiment Station, Boise, Idaho.

A Seeding Test with Fourwing Saltbush (Chamiza) in Western New Mexico

(An abstract from the published text of U. S. Forest Service Research Note RM-11 of the Rocky Mountain Forest and Range Experiment Station)

H. W. Springfield[1]

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Fourwing saltbush, generally called chamiza in New Mexico (Atriplex canescens (Pursh) Nutt.) is one of the most important and best known range shrubs in the Southwest. It provides forage the year around and is especially valuable as a source of energy and nutrients for livestock and game during winter and spring.

Seeding of chamiza on rangelands where adapted has been recommended by several investigators (Wilson, 1931; Bridges, 1941 and 1942; Reynolds et al., 1949). Little information is available, however, on how best to prepare the seedbed and plant the seed to obtain satisfactory stands.

This report summarizes results of experiments at one site in western New Mexico to compare the effects of different methods of seeding and seedbed preparation on the establishment, survival, and growth of chamiza.

CONCLUSIONS

Seedbed preparation probably is necessary to obtain good stands of chamiza in western New Mexico. Although plants were successfully established by drilling or cultipacker-seeding on an unprepared seedbed, the resulting stands were much poorer than those on prepared seedbeds.

Under certain conditions, the seeding of chamiza on unprepared seedbeds could be a worthwhile practice. For example, many ranges in the Southwest support a satisfactory cover of herbaceous plants but no browse. On such ranges, particularly those reserved for winter grazing, drilling chamiza into the undisturbed herbaceous cover might result in a fair stand of browse needed to supplement the animal diet.

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1 Range Conservationist, located at the Station's project headquarters at Albuquerque, in cooperation with the University of New Mexico; central headquarters are maintained at Fort Collins in cooperation with Colorado State University.

On methods of seedbed preparation tested, none proved definitely superior. Where the native cover is composed mainly of undesirable plants, plowing probably would be preferable. But where there is a remnant stand of desirable species, pitting is perhaps better than plowing. Although in this study pitting gave no advantage over plowing, the method deserves consideration because it damages only about a third of the native cover and is cheaper than plowing.

Neither of the two methods of seeding tested was found generally superior. The results suggest that drilling is a better method for seeding unprepared or pitted seedbeds, however, while cultipacker-seeding is better for seeding loose seedbeds.

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A man who can laugh at his troubles
Can always be sure of having
Something to laugh about.

(Region 2 Notes)

Those who deny freedom
to others
Deserve it not
for
themselves

A. Lincoln

SAFETY MESSAGE

The wheel was man's greatest invention
until he got behind it.

Would Wyoming Animals Eat SUGAR-COATED SAGEBRUSH?

By Morton May
Wyoming University Range Management Specialist

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There are several factors that determine the palatibility and choice of food by livestock and game animals. Among these are stage of growth, degree of rankness, succulence, kind of plant, chemical composition, degree of familiarity the particular animal has with the plant and, to some extent, the taste of the plant.

Most of these factors are related to one another and it would be difficult to assign an order of importance to them when considering all range plants. Let us consider only one of these factors at this time--taste.

Factors Governing Taste

The factors governing taste are also rather ambiguous but one that tends to stand out is sweetness. Generally, the sweeter foodstuffs are the more appealing they are. There is no apparent reason why this shouldn't hold true for livestock and game animals as well as it does for humans. Horses like sugar and animal nutrition experts agree that a major reason for adding molasses to feed rations is to make them more palatable.

Oklahoma Tests

One interesting example where the application of a sweetening agent gave excellent results was reported by Max Plice in Oklahoma in 1952. It was noticed that cattle refused to eat the more lush, greener grass which had been affected by their droppings, taking instead the unaffected grass in spite of its poorer appearance. With the application of various sweetening agents (i. e., molasses, sugar and saccharin) to the manure affected grass the cattle ate it not only readily but greedily. Further observations indicated that the cattle liked anything sweet whether it had food value or not.

Why then can't we make use of some plants like big sagebrush during feed shortage periods? Big sagebrush has a poor palatability ranking for many animals, but it has a relatively high nutrient content-and in most areas in Wyoming there is plenty of it available.

Wildlife Tests

In one study on Wyoming winter elk ranges big sagebrush was sprayed with a water saccharin solution to induce the elk to eat it during a

critical late fall period. Results proved unsuccessful in that they ate no more than the usual small amount of it. The study did, however, provide additional information for future work. It appears that the animals need substances they can smell, such as vinegar or anise oil, to attract them to the sweet-treated plants.

Other attempts in spraying western wheatgrass with a molasses solution in sheep pastures received similarly unsuccessful results.

Effect of Familiarity

Technicians working with game animals have reported some difficulty in getting older elk to consume feed rations containing molasses, but that the younger animals took it quite readily. Observations here seem to be more related to familiarity to a food item than to taste. Older animals, not used to a sweet food ration, tended to refuse it. Younger elk, not having time to acquire familiarity, took the sweetened ration without hesitation.

The meager information accumulated thus far seems to indicate that sweetening agents tend to work for cattle in most instances, but fail for sheep and some game animals. Further investigations will give the real answer and may provide a valuable tool in obtaining increased utilization of less desirable range plants.

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Better to
remain silent and be thought
a fool
than to speak out and remove
all doubt

A. Lincoln

Fear is faithlessness

George MacDonald